



Figs. 6(a-f) are various views of the faceplate shown in Fig. 7; and

Figs. 7(a-f) are various views of a sub plate component of a rocker switch assembly used in conjunction with the faceplate component of Fig. 7 according to an embodiment of the invention.

Detailed Description of a Preferred Embodiment of the Invention

An embodiment of the invention is directed to a rocker switch assembly 10 as illustrated in Figs. 1 and 2. Referring to Fig. 3, the rocker switch assembly includes a switch body 12 including switch contacts 14, a mounting strap 16 that engages the switch body, a frame 18 attached to the switch body, and a paddle 20 including an actuating arm 24 for enabling or disabling the switch contacts. The paddle 20 includes a pivot structure 22 on a lateral side surface thereof in the form of a rounded knob 23 that cooperatively engages a portion 24 of the frame and provides quasi-rotational movement of the paddle about a pivot axis 98. The paddle further includes a switch actuating structure 24 integrally attached to a rear surface of the paddle. The actuating structure has a distal end 25 that operationally enables an open-switch condition and a closed-switch condition. Top left lateral surface 38 and bottom lateral surface 39 of the paddle 20 each include a slot 47 that cooperatively engages a surface ridge 49 on the frame to limit the rotational motion of the paddle between a fixed forwardly tilted position represented by 32a in Fig. 4A and a fixed rearwardly tilted position as illustrated by 32b in Fig. 4B. The paddle has a front surface 42 having a generally convex longitudinal profile with a curvature defined by R_p as illustrated in Figs. 1 and 4. More particularly, the paddle has a uni-convex cylindrical exterior surface; i.e., it has a convex longitudinal profile and a flat transverse

profile. As shown in Fig. 3, the side edges 51, 61 of the frame 18 have a similarly shaped profile.

The upper and lower lateral surfaces 38, 39 of the paddle 20, also referred to herein as the upper and lower circumferential surfaces of the paddle, each have a curvature of radius R_B as shown in Figs. 1 and 4A. The radius R_B originates along the pivot axis 98 of the paddle.

As further shown in Figs. 1 and 4, in an assembled condition, the circumferential surfaces 38, 39 of the paddle 20 engage a space 52 between a portion 17 of the mounting strap 16 and a surface 19 of the frame 18 when the paddle is forwardly and rearwardly tilted.

According to an aspect of the embodiment as illustrated in Fig. 2, the paddle includes an indicia 74 that aides in recognition of switch status. For example, indicia 74 may be an indentation in the front surface 42 of the paddle that provides a tactile sensation to a user when operating the switch assembly. Alternatively, the indicia 74 may include a lens/LED combination that makes contact with an internal receptacle such that the indicia becomes illuminated when the switch is in either the on position or the off position. Various embodiments of an illuminated paddle are described in U.S. Patent Application Serial No. 10/726,173 filed on 12/02/03, which is hereby incorporated by reference in its entirety to the fullest allowable extent. It will be appreciated that the instant invention, however, is not limited to the type or form of indicia described herein above.

Another embodiment according to the invention is directed to the rocker switch assembly 10 described above and further including a faceplate component 100 as illustrated, for example, in Fig. 7. The faceplate is in the form of a frame 102 having an opening 105 defined by the perimeter 104, including upper 111 and opposing lower 113 inner surfaces and left 115 and opposing right 117 inner surfaces. The faceplate 100, similar to the paddle, has an exterior front surface 120 having a uni-convex cylindrical exterior shape with a curvature R_f as further illustrated in Figs. 4B and 8(e)6E. According to an aspect of the embodiment, the curvature R_f is not equal to the paddle curvature R_p .

Figs. ~~7-9~~6A-F and 7A-F show an exemplary embodiment of a faceplate component 100 and a sub-plate component 200 that provide a screwless or otherwise invisible attachment of the faceplate 100 to the switch assembly 10. Screwless faceplate components and assembly are

described in U.S. Application Serial No. 10/723,202, which is hereby incorporated by referenced in its entirety to the fullest applicable extent. It will be appreciated, however, that the instant invention is not limited to a screw less or otherwise invisible faceplate assembly design.

As illustrated in Fig. 4A and 4B, the upper and lower inner surfaces 111, 113, respectively, of the faceplate opening perimeter 104 have a curvature, R_A , having a radius origin along the pivot axis 98 coincident with the radius origin of the paddle edge curvature R_B . The common origin and radii values of the paddle and faceplate lateral surface curvatures provide consistent clearances between the paddle and the wall plate throughout the range of switching positions.

In an assembled condition, illustrated with the faceplate in cross section in Figs. 4A and 4B, it can be seen that the centerline 131 of the faceplate opening 104 intersects the centerline 132 of the paddle at a constant intersection point 140 along the pivot axis 98. Due to the curvature values R_p and R_f of the paddle face 42 and the faceplate surface 120, respectively, at least a portion of the convex paddle profile 42 is substantially tangent to a corresponding portion of the convex profile 120 of the faceplate surface, shown at T, when the paddle is either in the forwardly tilted position or the rearwardly tilted position. Based upon the contours of the paddle and the faceplate, and the limited rotational range of motion of the paddle, no portion of the paddle surface protrudes beyond the profile of the faceplate surface regardless of the paddle switch position.

The foregoing embodiments and aspects of the invention are disclosed herein by way



Examples only and are not intended to limit the scope of the present invention, which is solely defined by the appended claims. A person of ordinary skill in the art will appreciate many variations and modifications within the scope of this invention.